Federal Democratic Republic of Ethiopia

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ET ISO 12468-2 (2005) (English): External fire exposure to roofs -- Part 2: Classification of roofs

ISO INSIDE

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ETHIOPIAN STANDARD

First edition

External fire exposure to roofs — Part 2: Classification of roofs

ICS: 13.220.50; 91.060.20

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Building structures and elements of building (TC 42) and published by the Ethiopian Standards Agency (ESA).

The standard is identical with ISO 12468-2:2005 External fire exposure to roofs - Part 2: Classification of roofs published by International organization for standardization(ISO).

For the purpose of this Ethiopian Standard , the adopted text shall be modified as follows.

- The phrase “International Standard” shall be read as “Ethiopian Standard”; and
- A full stop (.) shall substitute comma (,) as decimal marker.

External fire exposure to roofs —

Part 2: Classification of roofs

1 Scope

This part of ISO 12468 establishes the classification of roofs tested in accordance with ISO 12468-1. Performance criteria are established with respect to the following:

- fire penetration or openings;
- external fire spread;
- falling of flaming droplets or debris.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12468-1, *External exposure of roofs to fire — Part 1: Test method*

ISO 13943:2000, *Fire safety — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12468-1 and ISO 13943:2000 apply.

4 Classification

4.1 The classification scheme in Table 1 is based on the results of testing a roof in accordance with ISO 12468-1. (Fire exposures: Level A test conditions include a large burning brand with radiation and wind; Level B test conditions include a small brand with wind.)

4.2 Four classes are established in the rank order: A1, A2, B1 and B2 with A1 being the highest performance. (Level A exposures result in A1 or A2 classes and Level B exposures result in B1 or B2 classes.)

5 Test results

Table 1 gives the test results.

Table 1 — Classification scheme

Test results	Classes			
	A1	A2	B1	B2
Fire penetration or openings	None	None within 15 min	None within 30 min	None within 15 min
External fire spread	Does not reach the limits of the measuring zone in any direction, within 30 min	Does not reach the limits of the measuring zone in any direction, within 15 min	Does not reach the limits of the measuring zone in any direction, within 30 min	Does not reach the limits of the measuring zone in any direction, within 15 min
Falling of flaming droplets or debris	None within 30 min	None within 15 min	None within 30 min	None within 15 min

6 Field of application

There are three parameters (pitch, nature of deck and level of fire exposure) in the test method that define the field of application.

6.1 Pitch

Classification obtained in a horizontal position shall apply to roof systems having a pitch of less than 5°.

Test results obtained at 15° shall apply to roof systems having a pitch of from 5° to 20°.

Test results obtained at 30° shall apply to roof systems having a pitch of greater than 20° up to 70°.

Roof systems having a pitch greater than 70° are outside the scope of this part of ISO 12468.

When two tests carried out at 0° and 30° give the same classification, that classification applies to any pitch from 0° to 70°.

Test results obtained at an alternative specified pitch shall apply to the roof system for that pitch only.

6.2 Nature of the deck

6.2.1 Test with standard supporting decks

Test results obtained with a standard supporting deck shall apply to all systems with the same components (including the thicknesses) installed in the same way, but with different decks as follows.

6.2.1.1 Test results obtained with a wood particleboard deck as defined in ISO 12468-1, with gaps between planks not exceeding 0,5 mm, shall apply to the following:

- any continuous wooden deck with a minimum thickness of 12 mm and with gaps not exceeding 0,5 mm;
- any non-combustible continuous deck with a minimum thickness of 10 mm.

6.2.1.2 Test results obtained with a wood particle board deck as defined in ISO 12468-1, with gaps of 5,0 mm + 0,5 mm between planks, shall apply to the following:

- any continuous wooden deck;
- any deck made from wooden planks with plain edges;
- any non-combustible deck with gaps not exceeding 5,0 mm.

6.2.1.3 Test results obtained with a trapezoidal profiled steel deck as defined in ISO 12468-1 shall apply to the following:

- any profiled steel deck;
- any non-combustible continuous deck with a minimum thickness of 10 mm.

6.2.1.4 Test results obtained with a trapezoidal aluminium deck as defined in ISO 12468-1 shall apply to the following:

- any profiled aluminium deck with thickness ⩾ than tested thickness;
- any profiled steel deck;
- any non-combustible continuous deck with a minimum thickness of 10 mm.

6.2.1.5 Test results obtained with a reinforced calcium silicate board as defined in ISO 12468-1 shall apply to the following:

- any non-combustible continuous deck with a minimum thickness of 10 mm.

6.2.2 Test with alternative supporting deck

Test results obtained with an alternative supporting deck shall apply only to that roof system.

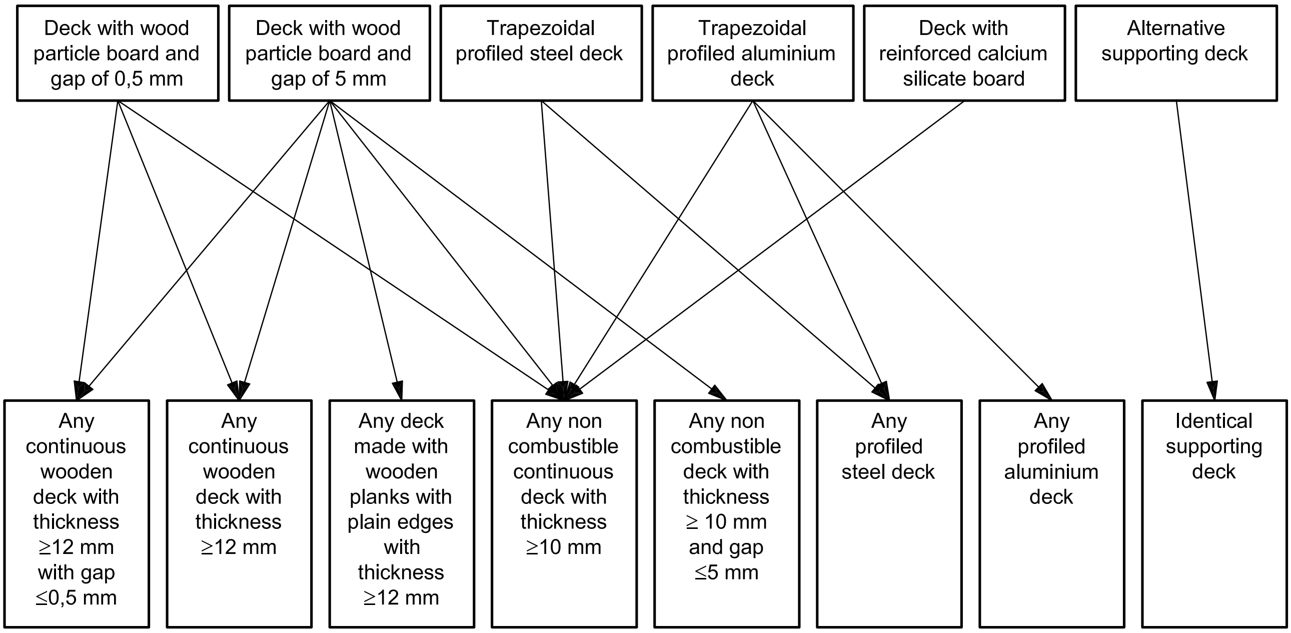
Deck with wood particle board and gap of 0,5 mm
Deck with wood particle board and gap of 5 mm
Trapezoidal profiled steel deck
Trapezoidal profiled aluminium deck
Deck with reinforced calcium silicate board
Alternative supporting deck
Any continuous wooden deck with thickness ≥12 mm with gap ≤0,5 mm
Any continuous wooden deck with thickness ≥12 mm
Any deck made with wooden planks with plain edges with thickness ≥12 mm
Any non combustible continuous deck with thickness ≥10 mm
Any non combustible deck with thickness ≥ 10 mm and gap ≤5 mm
Any profiled steel deck
Any profiled aluminium deck
Identical supporting deck

Figure 1 — Illustration of the field of application for the type of deck versus the standard supporting deck used for the construction of the test specimen

Any roof system that satisfies requirements related to level A1 is deemed to satisfy the same requirements at levels A2, B1 and B2 without any supplementary test.

Any roof system that satisfies requirements related to level A2 is deemed to satisfy the same requirements at levels B1 and B2 without any supplementary test.

Any roof system that satisfies requirements related to level B1 is deemed to satisfy the same requirements at level B2 without any supplementary test.

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6.3 Extension of the field of application

The field of application can be extended by changing only one parameter as described in 6.1 or 6.2 or 6.3.

To vary more than one parameter at the same time requires an additional test or an appraisal from a designated laboratory that issues classification reports.

7 Classification report

The report shall refer to this part of ISO 12468 and provide all information relevant to the selected level (A or B) of fire exposure, the selected test procedures, the product(s) tested and the classification obtained.

The report shall include the following:

a) name of the classification laboratory and the date of the issue of the report;

b) names of the sponsor, the product and the manufacturer of the specimen and its component parts, if known; if unknown, this must be stated;

c) complete reference (date and number) of the test report;

d) full description of the test roof deck. This shall include the method of attaching the roof covering e.g. nails, fixings, spacing, adhesives, the density or mass per unit area of materials and, where applicable, moisture content of the materials used. This shall also include the building materials' classes with reference to standards, the nature and quantity of adhesives or their rate of application, if necessary, to define the product uniquely;

e) pitch at which the specimen was tested;

f) observations and measurements during and after the test, including but not limited to the following:

    1) external fire spread, expressed by the time of occurrence, in minutes and seconds, at distances of 100 mm, 300 mm, 500 mm, 700 mm, 900 mm, 1 100 mm and 1 300 mm and the upper edge of the measuring zone, in an upwards direction;

    2) time that any flaming materials fall from the surface of the roof (see ISO 12468-1);

    3) burned length upwards, downwards and laterally as measured from the nearest edge of the projection of the brands (see ISO 12468-1);

    4) time, in minutes and seconds, at which fire penetration occurred and a description of the type of penetration, i.e. sustained flaming or glowing on the underside, flaming droplets or debris falling through the specimen or from the underside or the creation of an opening;

    5) description of the damage to the test specimen, including

        i) extent of non-flaming propagation (smouldering and glowing),

        ii) extent of internal damage (see ISO 12468-1) upwards, downwards and laterally,

        iii) maximum length of burnt material (see ISO 12468-1) upwards, downwards and laterally in each functional layer;

    6) time at which the test is terminated and the reason for termination (see ISO 12468-1);

g) classification determined according to Clause 5.

h) field of application for which the classification is valid, as defined in Clause 6.

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.
Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement
ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

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